

REMARKS

Prior to entry of this amendment, claims 1-20 are currently pending in the subject application. By this amendment, claims 2 and 10 have been cancelled without intent of prejudice to or disclaimer of the subject matter contained therein. The subject matter of now-cancelled claim 2 has been incorporated into claim 1. The subject matter of now-cancelled claim 10 has been incorporated into claim 4, which has been rewritten into independent format. As such, claims 1, 2-9 and 11-20 are presented for further consideration on the merits. Claims 1 and 4 are independent.

A. Introduction

In the outstanding Office action,

- 1) the request filed on October 17, 2007 was characterized as an improper Request for a Continued Prosecution Application (CPA), but was treated as if it was a proper Request for Continued Examination (RCE);
- 2) claims 1, 4, 6-9, 18 and 20 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2003/0086790 to Ma ("the Ma reference");
- 3) claims 1-2, 6-7, 11-12 and 17-18 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,751,317 to Peeters et al. ("the Peeters et al. reference");
- 4) claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. reference;
- 5) claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ma reference;
- 6) claims 9-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. reference;
- 7) claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ma reference;
- 8) claims 13-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. reference in view of U.S. Patent No. 6,062,681 to Field et al. ("the Field et al. reference");
- 9) claim 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. and Field et al. references as applied to claim 15; and
- 10) claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. Field et al. references as applied to claim 13.

B. Asserted Anticipation Rejection of Claims 1, 4, 6-9, 18 and 20

In the outstanding Office action, the request filed on October 17, 2007 was characterized as an improper Request for a Continued Prosecution Application (CPA), but was treated as if it was a proper Request for Continued Examination (RCE). Applicants respectfully traverse the characterization of the October 17th request as a Request for a CPA. Inspection of the request filed on October 17, 2007 clearly shows that an RCE was submitted.

C. Asserted Anticipation Rejection of Claims 1, 4, 6-9, 18 and 20

In the outstanding Office action, claims 1, 4, 6-9, 18 and 20 were rejected under 35 U.S.C. § 102(e) as being anticipated by the Ma reference. This rejection is respectfully traversed for at least the reasons set forth below.

Independent claim 1 has been amended to include the subject matter of now-cancelled claim 2. While claim 2 was rejected by the outstanding Office action in a separate rejection,¹ no part of the rejection of claim 2 is based upon the Ma reference. Applicants respectfully submit that claim 2 distinguishes over the Ma reference. Hence, it is respectfully submitted that amended claim 1, and claims 6-9, 18 and 20 by dependency, distinguish over the Ma reference. Accordingly, applicants respectfully request that the rejection of claims 1, 6-9, 18 and 20 over the Ma reference be favorably reconsidered and withdrawn.

Claim 4 has been rewritten into independent format and has been amended to include the subject matter of now-cancelled claim 10. In a separate rejection,² the outstanding Office action acknowledges³ that the Ma reference does not anticipate claim 10. Hence, it is respectfully submitted the Ma reference does not anticipate amended claim 4.

¹ Namely, the rejection of claims 1-2, 6-7, 11-12 and 17-18 under 35 U.S.C. § 102(b) over the Peeters et al. reference, which is traversed below.

² See discussion below under heading "G. Asserted Obviousness Rejection of Claim 10."

³ See page 7, paragraph 13, of the outstanding Office action.

In view of the foregoing discussion, applicants respectfully request that the rejection of claims 1, 4, 6-9, 18 and 20 over the Ma reference be favorably reconsidered and withdrawn.

D. Asserted Anticipation Rejection of Claims 1-2, 6-7, 11-12 and 17-18

In the outstanding Office, claims 1-2, 6-7, 11-12 and 17-18 were rejected under 35 U.S.C. § 102(b) as being anticipated by the Peeters et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

Independent claim 1 has been amended to include the subject matter of now-cancelled claim 2.⁴ A feature that distinguishes amended claim 1 over the Peeters et al. reference is "the cross-sectional area of the fluid exit increases in a direction toward the pumping chamber." Under a reasonable interpretation of the term "chamber" as it relates to the Peeters et al. reference, the cross-sectional area of the fluid exit taught by the Peeters et al. reference decreases in a direction toward the pumping chamber, rather than increases.

1. Two Interpretations of "Chamber" vis-à-vis Peeters et al. Reference

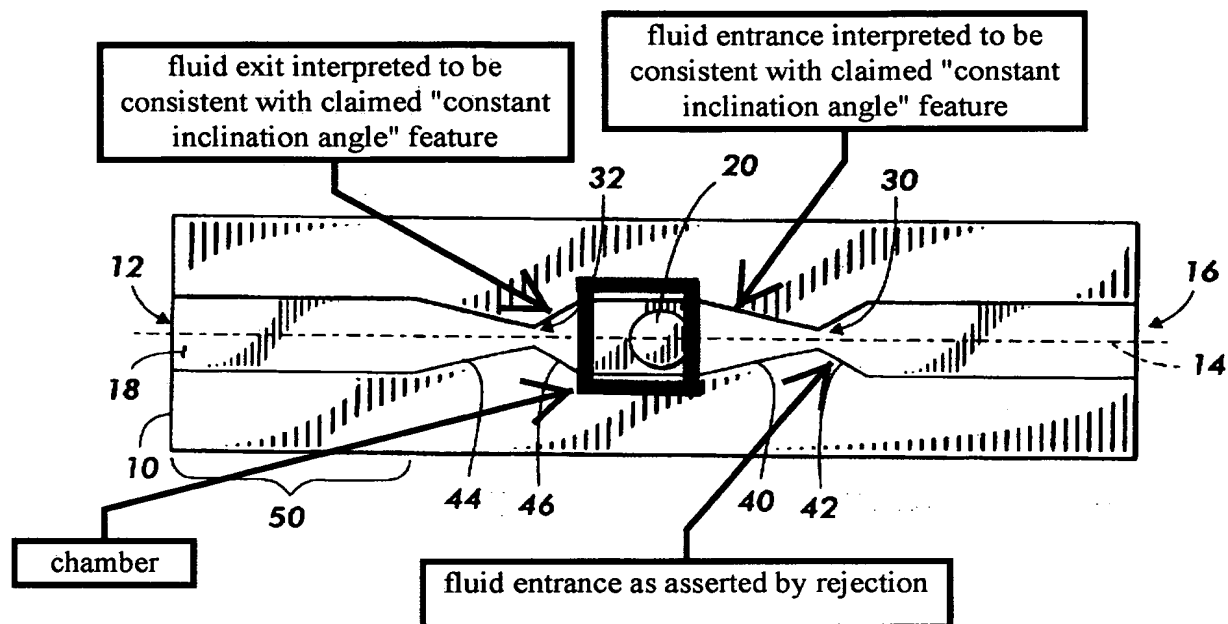
The rejection interprets a space within a channel 12 that surrounds a heating element 20 of the Peeters et al. reference as corresponding to the claimed pressure chamber, a fluid inlet 16 as corresponding to the claimed fluid entrance, and a nozzle 18 as corresponding to the claimed fluid exit. In order for a cross-sectional area of each of the fluid entrance and the fluid exit to vary along a direction of the fluid flow so as to have a constant inclination angle along its respective entire length, as claimed, the pumping chamber would have to be interpreted either in the manner illustrated in a first or second annotated version of FIG. 1 of the Peeters et al. reference, both of which are printed below.

⁴ The rejection of claim 2 is traversed on the basis that this claim has been cancelled, thereby overcoming its rejection.

2. First Interpretation of "Chamber" According To First Annotated
Version Of FIG. 1 of Peeters et al. Reference

According to a first interpretation of "chamber" as illustrated in the first version of the annotated version of FIG. 1 of the Peeters et al. reference, the pumping chamber corresponds to a rectangular cylindrical segment of the channel 12 of the Peeters et al. reference.

Annotated FIG. 1. -- 1st Version
(Peeters et al. reference)



A first taper 40 would correspond to the claimed fluid entrance, not a combination of the first taper 40 and a second taper 42 else the cross-sectional area of the fluid entrance 40/42 would not vary along a direction of the fluid flow so as to have a constant inclination angle along its entire length. Similarly, a fourth taper 46 would correspond to the claimed fluid exit.

Assuming for the sake of discussion that this interpretation of "chamber" was reasonable, amended claim 1 would distinguish over the Peeters et al. reference at least because of a claimed feature that "the cross-sectional area of the fluid entrance decreases in a direction toward the pumping chamber, ...". Inspection of the first annotated version of FIG. 1 reveals

that the cross-sectional area of the fluid entrance, namely, the first taper 40, increases in a direction toward the pumping chamber, rather than decreases.

3. First Interpretation of "Chamber" Not Reasonable

It is respectfully submitted that interpretation of "chamber" as illustrated in the first annotated version of FIG. 1 is not reasonable. Regarding claim interpretation, it is reasonable only to interpret the claim term "chamber" according to its ordinary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention ("skilled artisan").⁵ An ordinary meaning of "chamber" appropriate to the present context is an enclosed space or compartment, e.g., the chamber of a pump, a compression chamber, etc.⁶ In the first annotated version of FIG. 1, the pressure chamber is a rectangular cylindrical segment of the channel 12 whose left and right ends are substantially open. As such, the rectangular cylindrical segment cannot be regarded as an enclosed space because it is substantially open at its left and right ends. Hence, the interpretation of "chamber" as illustrated in the first annotated version of FIG. 1 is not reasonable.

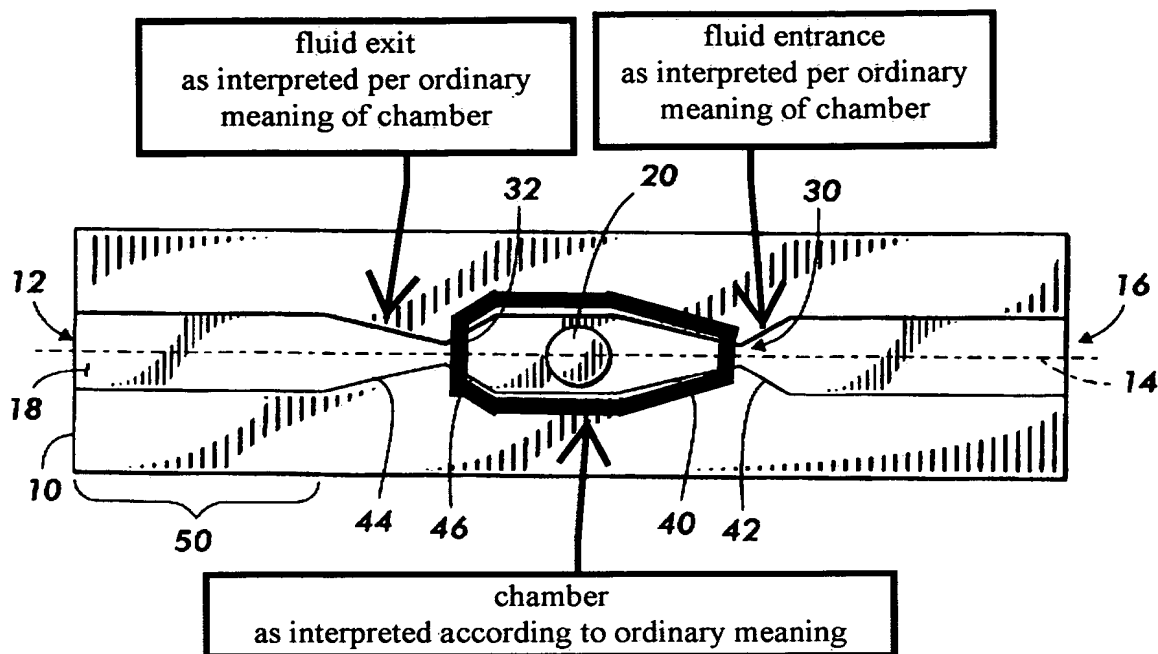
4. Second Interpretation of "Chamber" According To First Annotated Version Of FIG. 1 of Peeters et al. Reference

Instead of the first interpretation of "chamber," applicants respectfully submit that the skilled artisan would have given a second interpretation to "chamber" by applying the ordinary meaning of "chamber" to the Peeters et al. reference, as illustrated in the second annotated version of FIG. 1 of the Peeters et al. reference printed below.

⁵ See, e.g., the Manual of Patent Examining Procedure ("MPEP"), § 2111.01.III.

⁶ The American Heritage® Dictionary of the English Language, 4th ed. Boston: Houghton Mifflin, 2000. URL: <http://www.bartleby.com/61/10/C0231000.html>, February 1, 2008.

Annotated FIG. 1. -- 2nd Version
(Peeters et al. reference)



The skilled artisan would have included a first taper 40 and a fourth taper 46 within the chamber, which then defines a substantially enclosed space. Further, the skilled artisan would have interpreted a second taper 42 as corresponding to a fluid entrance and a third taper 44 as corresponding to a fluid exit. As would have been understood by the skilled artisan, inspection of the second annotated version of FIG. 1 reveals that the cross-sectional area of the fluid exit, namely, third taper 44, decreases in a direction toward the pumping chamber, rather than increases. Hence, the noted, feature, namely, the fluid exit whose cross-sectional area increases in a direction toward the pumping chamber, is neither disclosed nor suggested by the Peeters et al. reference and, thus, distinguishes claim 1 over the Peeters et al. reference.

In view of foregoing discussion, applicants respectfully submit that the Peeters et al. reference does not teach or suggest each and every element of amended claim 1 and, thus, claims 6-7, 11-12 and 17-18 by dependency. Accordingly, applicants respectfully request

that the rejection of claims 1-2,⁷ 6-7, 11-12 and 17-18 be favorably reconsidered and withdrawn.

E. Asserted Obviousness Rejection of Claim 3

In the outstanding Office action, claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

Claim 3 depends from claim 1. The basis of how claim 1 distinguishes over the Peeters et al. reference has been discussed above. Hence, claim 3 distinguishes over the Peeters et al. reference by dependency. Accordingly, applicants respectfully request that the rejection of claim 3 over the Peeters et al. reference be favorably reconsidered and withdrawn.

F. Asserted Obviousness Rejection of Claim 5

In the outstanding Office action, claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ma reference. This rejection is respectfully traversed for at least the reasons set forth below.

Claim 5 depends from claim 4. The basis of how claim 4 distinguishes over the Ma reference is discussed below.⁸ Hence, claim 5 distinguishes over the Ma reference by dependency. Accordingly, applicants respectfully request that the rejection of claim 5 over the Ma reference be favorably reconsidered and withdrawn.

G. Asserted Obviousness Rejections of Claims 9-10

In the outstanding Office action, claims 9-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

⁷ Again, the rejection of claim 2 is traversed on the basis that this claim has been cancelled, thereby overcoming its rejection.

⁸ See below under heading " H. Asserted Obviousness Rejection of Claim 10."

1. Claim 9

Amended claim 9 depends from claim 1.⁹ The basis of how claim 1 distinguishes over the Peeters et al. reference has been discussed above. Hence, claim 9 distinguishes over the Peeters et al. reference by dependency. A further distinction of claim 9 over the Peeters et al. reference is that each of the pumping chamber and the heating element has a hexahedral shape. From a three-dimensional perspective, under either of the interpretations of the term "chamber" discussed above,¹⁰ the chamber taught by the Peeters et al. reference would have either four sides¹¹ or eight sides,¹² but is not a hexahedral shape. Hence, the noted feature, namely, a hexahedral shape, distinguishes claim 9 over the Peeters et al. reference. Accordingly, applicants respectfully request that the rejection of claim 9 over the Peeters et al. reference be favorably reconsidered and withdrawn.

2. Claim 10

Regarding claim 10, claim 4 has been rewritten into independent format and has been further amended to include the subject matter of now-cancelled claim 10¹³. A feature that distinguishes amended independent claim 4 over the Peeters et al. reference is that the cross-sectional area of the fluid entrance increases in a direction toward the pumping chamber. Under the interpretation of the term "chamber" that the skilled artisan would have applied,¹⁴ inspection of the second annotated version of FIG. 1¹⁵ reveals that the cross-sectional area of the fluid entrance, namely, second taper 42, decreases in a direction toward the pumping chamber, rather than increases. Hence, the noted, feature, namely, the fluid entrance whose cross-sectional area increases in a direction toward the pumping chamber, distinguishes claim

⁹ Support for the amendment to claim 9 can be found, e.g., in paragraph [0044] of the specification.

¹⁰ See above under heading "D. Asserted Anticipation Rejection of Claims 1-2, 6-7, 11-12 and 17-18."

¹¹ See the first annotated version of FIG. 1, printed and discussed above.

¹² See the first annotated version of FIG. 1, printed and discussed above.

¹³ The rejection of claim 10 is traversed on the basis that this claim has been cancelled, thereby overcoming its rejection.

¹⁴ See above under heading "D. Asserted Anticipation Rejection of Claims 1-2, 6-7, 11-12 and 17-18."

¹⁵ *Ibid.*

4 over the Peeters et al. reference. Accordingly, applicants respectfully submit that amended claim 4 is allowable over the Peeters et al. reference.

H. Asserted Obviousness Rejection of Claim 10

In the outstanding Office action, claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ma reference. This rejection is respectfully traversed for at least the reasons set forth below.

Regarding claim 10, claim 4 has been rewritten into independent format and has been amended to include the subject matter of now-cancelled claim 10¹⁶. A feature that distinguishes amended independent claim 4 over the Ma reference is "each of the pumping chamber and the heating element has a circular shape." The rejection acknowledges that the noted feature represents a difference vis-à-vis the Ma reference, but goes on to characterize the difference as obvious using language that implies the difference is merely a matter of design choice. Applicants respectfully disagree. The rejection relies upon the case of *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1954) to support the obviousness rationale. According to the MPEP § 2144.04.IV.B (underlined emphasis added):

The [Daley] court held that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.

In view of the much more recent decision by the Federal Circuit concerning design choice rejections, namely, *In re Chu*, 66 F.3d 292, 36 USPQ 2d 1089 (Fed. Cir. 1995), applicants respectfully submit that *Daily*-type evidence can include applicants' arguments. Such arguments are presented below.

¹⁶ The rejection of claim 10 is traversed on the basis that this claim has been cancelled, thereby overcoming its rejection.

In the *Chu* case, the Federal Circuit reversed a rejection by the Board of Appeals and Interferences of the United States Patent and Trademark Office ("Board").¹⁷ Regarding cases relied upon by the Board to support its position, the Federal Circuit noted the applicants in those cases had failed to set forth any reasons why the differences between the claimed inventions and the prior art resulted in a different function or gave unexpected results.¹⁸ Further as to the *Chu* case, regarding any different function and/or unexpected results which applicants might argue, the Federal Circuit held that there is no requirement for corresponding evidence to be present in the specification as a prerequisite to consideration of applicants' arguments by an Examiner, i.e., that such arguments must not be disregarded by an Examiner.¹⁹ Here, applicants respectfully submit a *Chu*-type reason for the noted difference is that the claimed feature of the pumping chamber and the heating element having a circular shape results in a function of uniform heating by the heating element of ink in the pumping chamber.

The Ma reference is silent regarding the shape of any heating element that may be inherent to the non-mechanical pump illustrated in FIGS. 1A-1B, i.e., the shape of any such heating element in FIGS. 1A-1B is undisclosed. No inference can be made regarding a function resulting from a relationship between the rectangular pumping chamber and the undisclosed shape of the heating element of the Ma reference. As no function can be inferred from the Ma reference, applicants respectfully submit that the function resulting from the claimed feature is different. In view of applicants' *Chu*-type reason, it is improper for the rejection to dismiss the differences between amended claim 4 and the Peeters et al. reference as merely a matter of design choice. Accordingly, applicants respectfully submit that amended claim 4 is allowable over the Peeters et al. reference.

¹⁷ *Chu*, 36 USPQ 2d at 1090.

¹⁸ *Chu*, 36 USPQ 2d at 1094.

¹⁹ *Chu*, 36 USPQ 2d at 1094.

I. Asserted Obviousness Rejections of Claims 13-15

In the outstanding Office action, claims 13-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. reference in view of the Field et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

Claims 13-15 ultimately depend from claim 1. The basis of how claim 1 distinguishes over the Peeters et al. reference has been discussed above. Hence, claims 13-15 distinguish over the Peeters et al. reference by dependency.

In addition to the Peeters et al. reference, the rejection relies upon the Field et al. reference as teaching claimed features acknowledged as missing from the Peeters et al. reference. Assuming for the sake of discussion that the interpretation of the Field et al. reference is reasonable, this does not make up for the deficiencies of the Peeters et al. reference noted above regarding claim 1, and regarding claims 13-15 by dependency. Accordingly, applicants respectfully request that the rejection of claims 13-15 be favorably reconsidered and withdrawn.

J. Asserted Obviousness Rejection of Claim 16

In the outstanding Office action, claim 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. and Field et al. references as applied to claim 15. This rejection is respectfully traversed for at least the reasons set forth below.

Claims 16 ultimately depends from claim 1. The basis of how claim 1 distinguishes over the Peeters et al. reference has been discussed above. Hence, claim 16 distinguishes over the Peeters et al. reference by dependency.

In addition to the Peeters et al. reference, the rejection relies upon the Field et al. reference as teaching claimed features acknowledged as missing from the Peeters et al. reference. Assuming for the sake of discussion that the interpretation of the Field et al. reference is reasonable, this does not make up for the deficiencies of the Peeters et al.

reference noted above regarding claim 1, and regarding claim 16 by dependency.

Accordingly, applicants respectfully request that the rejection of claim 16 be favorably reconsidered and withdrawn.

K. Asserted Obviousness Rejection of Claim 19

In the outstanding Office action, claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Peeters et al. and Field et al. references as applied to claim 13. This rejection is respectfully traversed for at least the reasons set forth below.

Claim 19 depends from claim 13 and ultimately depends from claim 1. The basis of how claim 1 distinguishes over the Peeters et al. reference has been discussed above. Hence, claim 19 distinguishes over the Peeters et al. reference by dependency.

In addition to the Peeters et al. reference, the rejection of claim 13, and claim 19 by dependency, relies upon the Field et al. reference as teaching claimed features acknowledged as missing from the Peeters et al. reference.. Further, the rejection acknowledges a difference between the combination of the Peeters et al. reference and the Field et al. reference and claim 19, but dismisses the difference as merely an obvious rearrangement of parts.

Assuming for the sake of discussion that the interpretation of the Field et al. reference is reasonable and that dismissal of the noted difference is reasonable, this does not make up for the deficiencies of the Peeters et al. reference noted above regarding claim 1, and regarding claim 19 by dependency. Accordingly, applicants respectfully request that the rejection of claim 19 be favorably reconsidered and withdrawn.

L. Conclusion

The remaining documents cited in the Office action were not relied on to reject the claims. Therefore, no comments concerning these documents are considered necessary at this time.

The above remarks demonstrate failings of the rationales for the outstanding rejections, and are sufficient to overcome the outstanding rejections. These remarks, however, are not intended to, nor need they, comprehensively address each and every reason for the patentability of the claimed subject matter over the applied art. Accordingly, applicants respectfully submit that the claims are allowable for reasons including, but not limited to, those set forth above, and patentability of the claims does not depend solely on the particular claim element(s) discussed above.

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

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PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.